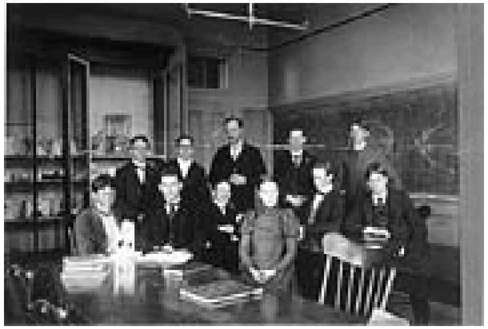


Classroom Presenter

Richard Anderson, Ruth Anderson, Crystal Hoyer, Beth Simon, Fred Videon, Steve Wolfman

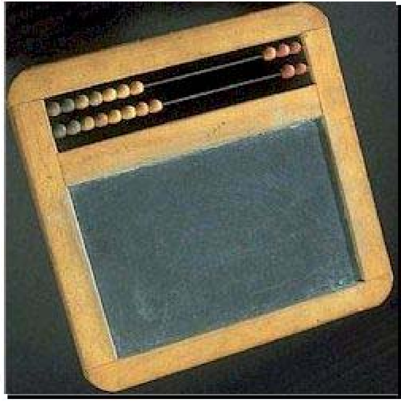
Educational Technology

…in the winter of 1813 & '14 … I attended a mathematical school kept in Boston…On entering his room, we were struck at the appearance of an ample *Black Board* suspended on the wall, with lumps of chalk on a ledge below, and cloths hanging at either side. I had never heard of such a thing before. [Samuel J. May, 1855]

Classroom Presenter

- Distributed Presentation System
  - Synchronized display of slides
  - Shared TPC Ink
  - Experimental Feedback Features
- Technology
  - Uses CXP Multicast
  - Slides distributed as images
  - TPC Ink

Presenter



- Initial problem
  - Develop a distributed presentation space for use in a distance learning class
- Later
  - Many of the same issues / challenges in large lecture classroom

Large lecture classes

- Challenges
  - Maintaining attention
  - Communication
  - Feedback from students
  - Flexibility in presentation materials
  - Conducting activities in class

Background studies

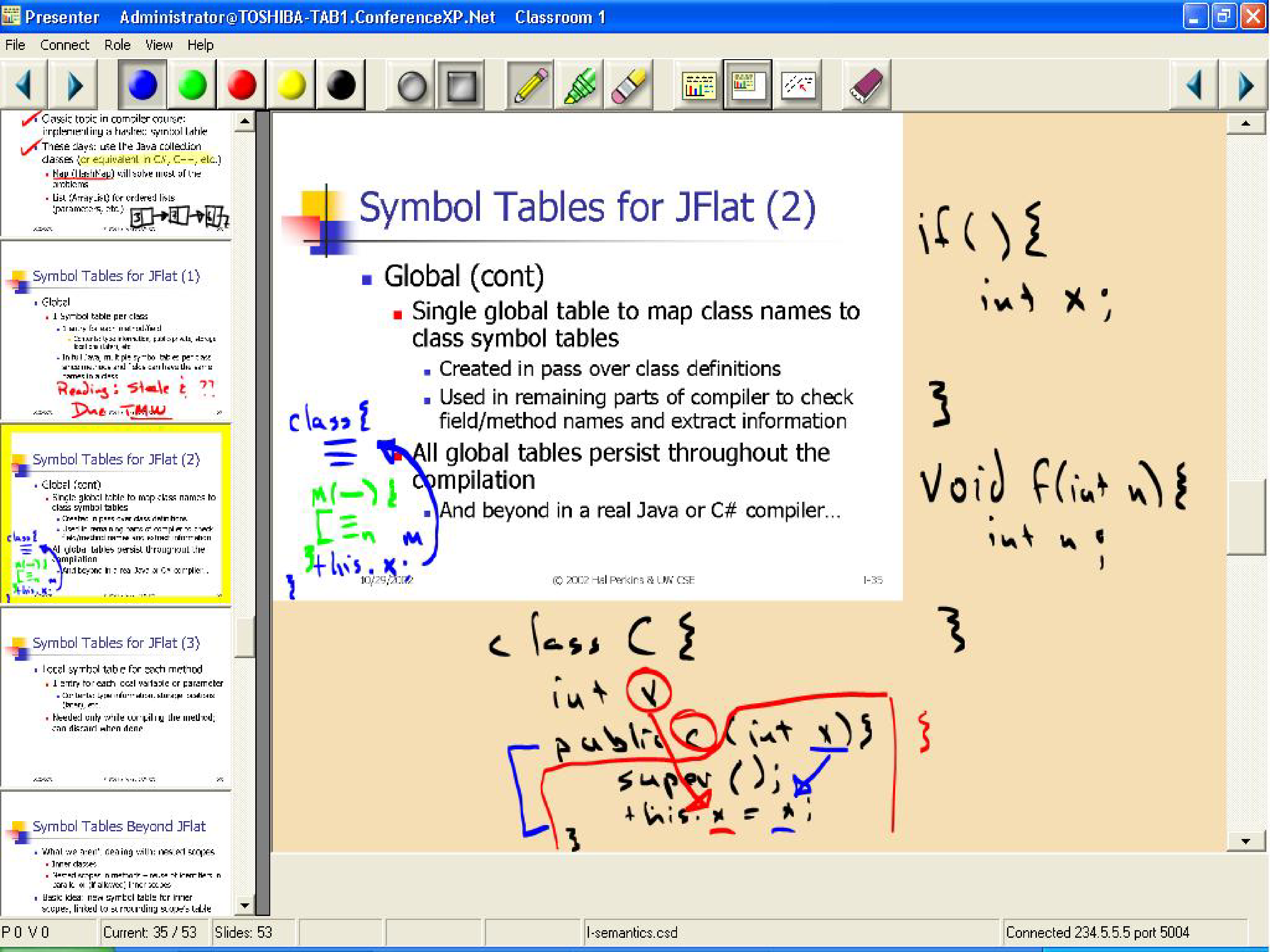
- Studied UW CSE PMP
  - Interviews, Surveys, Observations
- Greatest pain in distance course
  - Presentation environment
  - “PowerPoint is a pain for the same reason it’s a pain in a non-distance course, the slides impose a rigid structure on the lecture and make it more difficult to adjust to the interactions that occur during it.”
  - “PowerPoint sucks the life out of a class.”

Motivation

- Support flexibility in instruction
  - Written annotation for
    - Spontaneous discussion
    - Working examples
    - Audience participation
    - Annotating diagrams
    - Attention marks
- Gain benefits of computer projected slides and whiteboard

Classroom deployments

- Wide range – master’s level courses, intro courses, algorithms, digital design, software engineering . . .
- University of Washington, University of Virginia, University of San Diego


Presenter Administrator@TOSHIBA-TAB1.ConferenceXP.Net Classroom 1
File
Connect
Role
View
Help

- Classic topic in compiler course: implementing a hashed symbol table
- These days: use the Java collection classes (or equivalent in C#, C++, etc.)
  - Map (HashMap) will solve most of the problems
  - List (ArrayList) for ordered lists (parameters, etc.)

3 → 3 → 6 7 2

Symbol Tables for JFlat (1)

- Global
  - 1 Symbol table per class
    - 1 entry for each method/field
    - In full Java, multiple symbol tables per class since methods and fields can have the same names in a class

Reading: Steele & ??

Due TMW

Symbol Tables for JFlat (3)

- Local symbol table for each method
  - 1 entry for each local variable or parameter
  - Needed only while compiling the method; can discard when done

Symbol Tables Beyond JFlat

- What we aren't dealing with: nested scopes
  - Inner classes
- Basic idea: new symbol table for inner scopes, linked to surrounding scope's table

Symbol Tables for JFlat (2)

- Global (cont)
  - Single global table to map class names to class symbol tables
    - Created in pass over class definitions
    - Used in remaining parts of compiler to check field/method names and extract information
  - All global tables persist throughout the compilation
    - And beyond in a real Java or C# compiler…

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```
class {
  ≡
  M(—) {
    [ ≡n      m
  } this.x;
}
```

```
if ( ) {
   int x;
}

void f(int n) {
   int n;
}
```

```
class C {
   int x
   public C (int x) {
      super ( );
      this.x = x;
   }
}
```

P 0 V 0 | Current: 35 / 53 | Slides: 53 | I-semantics.csd | Connected 234.5.5.5 port 5004

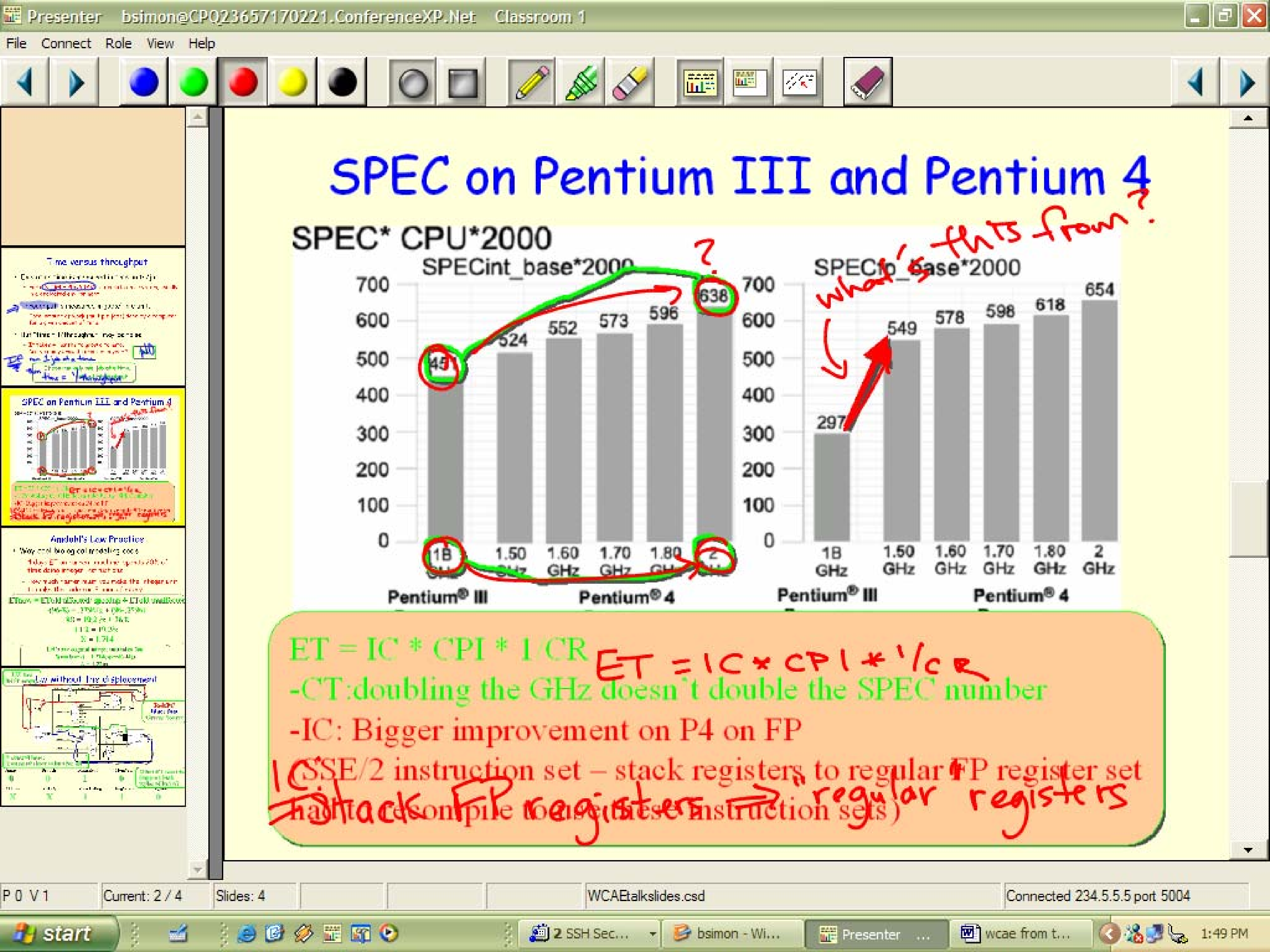
Positive reception from instructors and students

- Positive comments and repeat use by instructors
- Student surveys
  - Student comparison vs. PowerPoint

	less	no change	more
Attention to lecture	4%	39%	57%
Understanding of lecture	2%	52%	46%

Instructor innovations and suggestions

- Taking tablet to the audience
- Elaborate preparation of instructor notes on second deck of slides
- Improved navigation (flyout from thumbnails)
- Collective brainstorming



SPEC on Pentium III and Pentium 4

ET = IC * CPI * 1/CR ET = IC * CPI * 1/CR

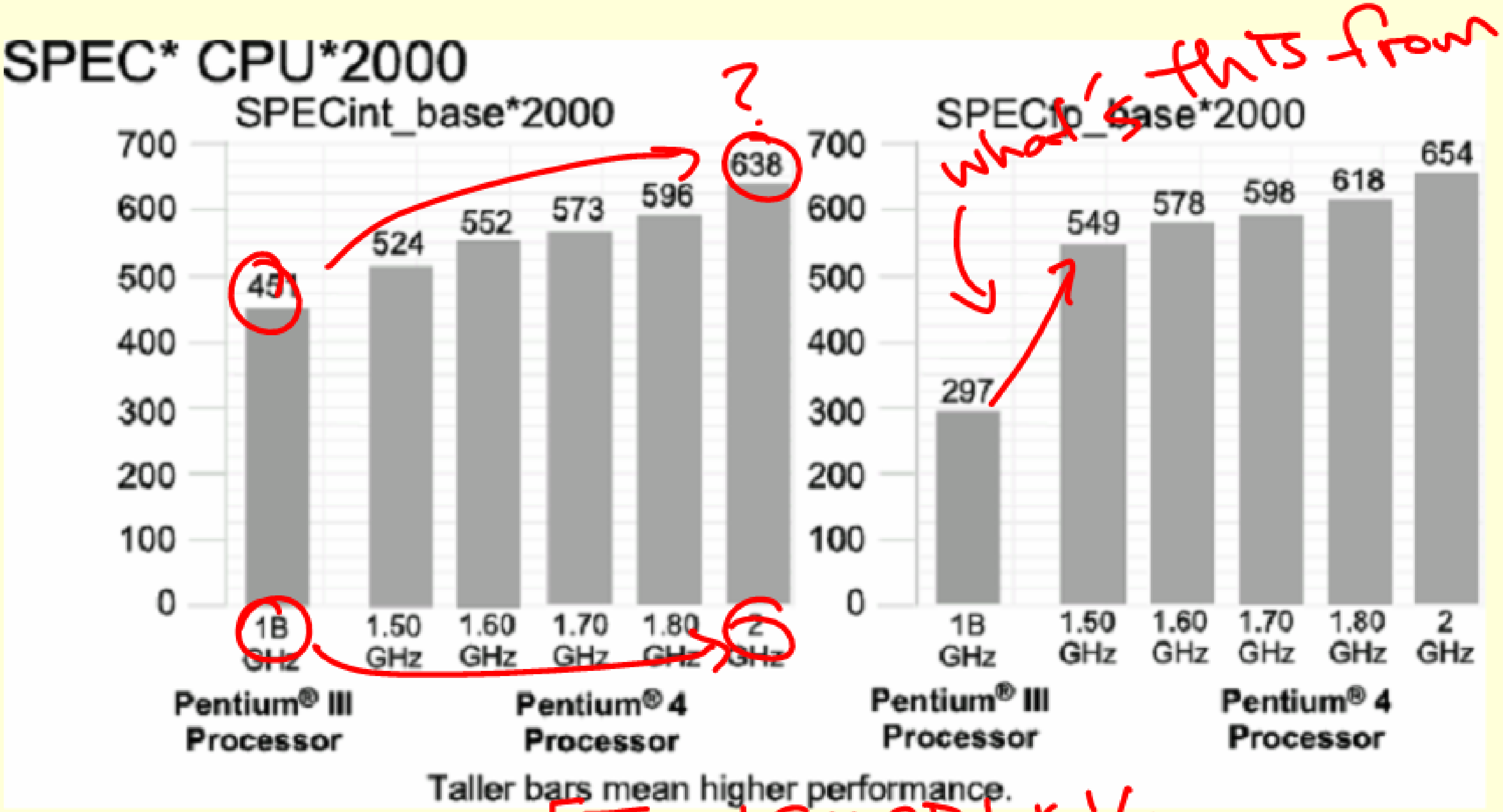
-CT:doubling the GHz doesn't double the SPEC number

-IC: Bigger improvement on P4 on FP

IC (SSE/2 instruction set – stack registers to regular FP register set

~~hard to compile to use these instruction sets)~~ stack FP registers → "regular" registers

SPEC on Pentium III and Pentium 4



?

what's this from?

$ET = IC * CPI * 1/CR$

- What do you notice?

IC:
Stack FP registers ⇒ "regular" registers

Classroom Feedback System

- Student feedback does not scale
- Encourage participation
- Ease of expression
- If the method does scale, how does the instructor make sense of it

Design choices

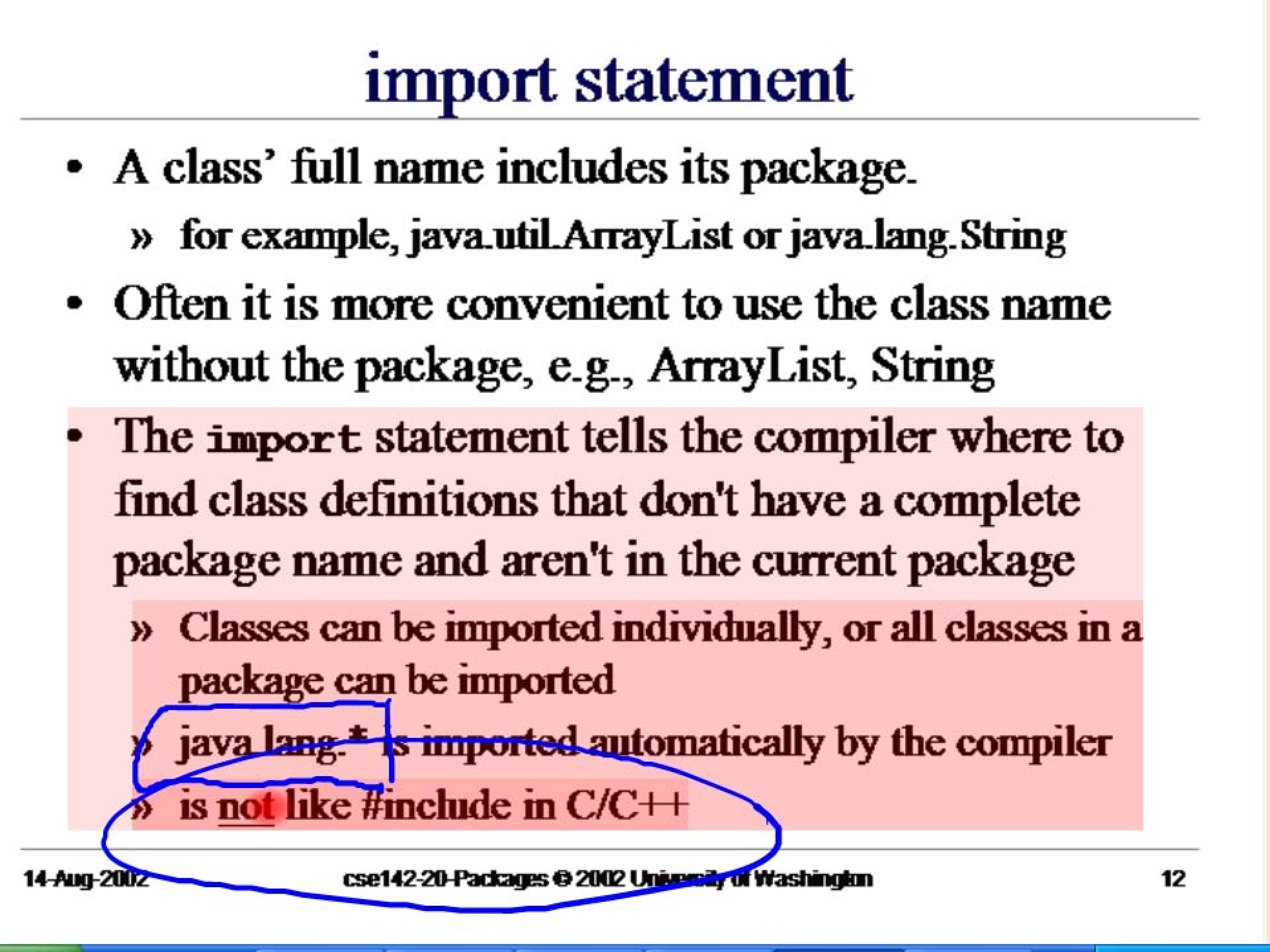
- Low attention requirements
- Embed in context of the slide
  - Slides are the mediating artifact
- Fixed feedback
  - Avoid having to compose questions
  - Instructor control of feedback
    - Example, More Information, Got It
    - Slow Down, Question, Explain, Cool Topic

Experiment

- Roughly 12 students given laptops to use in class
- 2 week deployment in CSE 142
  - 4 weeks no intervention
  - 2 weeks Tablet PC
  - 2 weeks Tablet PC + feedback system
- Extensive observations, logging, surveys, interviews

Results

- Mixed results
  - Classroom culture not what we had expected
  - Instructor goals different than expected
- Interactions did increase
  - Pre CFS
    - 2.4 (spoken) episodes per class
  - With CFS
    - 2.6 (spoken) episodes per class
    - 14.8 (feedback) episodes per class
    - 5.0 (feedback – "Got it") episodes per class



import statement

- A class' full name includes its package.
  - for example, java.util.ArrayList or java.lang.String
- Often it is more convenient to use the class name without the package, e.g., ArrayList, String
- The `import` statement tells the compiler where to find class definitions that don't have a complete package name and aren't in the current package
  - Classes can be imported individually, or all classes in a package can be imported
  - java.lang.* is imported automatically by the compiler
  - is <u>not</u> like #include in C/C++

import java.util.Hashmap;

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Conclusions and Future work

- Tablet PC based presentation successful in the classroom
- Software available for download
  - //www.cs.washington.edu/education/dl/presenter/
- Version 2.0 should be available this summer
- Ongoing research work on integration with student devices
  - Token passing for student contributions
  - Structure Interaction Presentations for support of active learning in the classroom